

REMARKS

Applicants have studied the Office Action dated July 27, 2006. No new matter has been added. By virtue of this amendment, claims 1 - 26 are pending. Reconsideration and further examination of the pending claims in view of the above amendments and the following remarks is respectfully requested.

In the Office Action the Examiner:

- (2) Rejected claims 5, 7, 9, and 13 because of informalities;
- (3) Rejected claims 1, 2, 22, and 23 under 35 U.S.C. 102(b) as being anticipated by Kim (U.S. 5,943,099);
- (4) Rejected claims 1-14, 16, 18, and 22-25 under 35 U.S.C. 102(b) as being anticipated by Ledin et al. (U.S. 5,936,676); and
- (5) Indicated claims 15, 17, 19-21 and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims.

(2) Informalities

As noted above, the Examiner objected to 5, 7, 9, and 13 because of informalities. The Applicant wish to thank Examiner Hsia for suggesting the appropriate correction. Claims 5, 7, 9, and 13 has been amended accordingly to correct the informalities. This clarification is independent of patentability and therefore, this amendment does not narrow the scope of claims 5, 7, 9, and 13 within the meaning of *Festo*.¹ Accordingly, the Applicants respectfully submit that the Examiner's rejection to claims 5, 7, 9, and 13 has been overcome and that claims 5, 7, 9, and 13 are now in a condition of allowance which allowance is respectfully requested.

(3) Rejection under 35 U.S.C. 102(b) by Kim

As noted above, the Examiner rejected claims 1, 2, 22, and 23 under 35 U.S.C. 102(b) as being anticipated by Kim (U.S. 5,943,099). Independent claims 1 and 22 have been amended to clarify over Kim. Amended independent claims 1 and 22 recites *inter alia*:

wherein the interpolating performed on the output signal is produced from a selection of a spatial interpolation and a temporal interpolation, whereby the selection is made based upon a determination of,

a variable degree of presence of at least one of the spatial interpolation and the temporal interpolation in a composition of the output signal, with the composition having a range from one-hundred percent of the spatial interpolation to one-hundred percent of the temporal interpolation,

a function of a detection of motion in a portion of a video image being interpolated including a detection of a detail measurement in the portion of the video image for determining a degree of reliability the spatial interpolation.

Support for these amendments is found in the specification at, for example, page 4, par. [0015], page 7, par. [0054], page 10, par. [0075], page 21 through page 22 pars. [0206 - 0213] and page 26 through page 27 pars. [0259 - 0272]. No new matter has been added by these amendments.

Kim discloses an interpolation method where the determination between a spatial interpolation and a temporal interpolation is made as a function of: i) the motion correlation; (ii) the vertical correlation, and (iii) the temporal-vertical correlation. Each of these parameters are compared with setting values. See Kim Abstract and FIG. 1. The

¹ Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd., No. 00-1543 (122 S. Ct.

object in Kim is to improve the reliability of the dynamical information and to reduce the artifacts by interpolating the image as a function of temporal and spatial correlations.

The conditions of selection between the two interpolations are described more particularly in Kim at col. 7, lines 18-39. Specifically, Kim discloses that the determination to realize an interpolation is made with a simple switch (140). So, it is clearly described that the system of Kim selects EITHER the spatial interpolation OR the temporal interpolation according to the results of the comparison of: i) the motion correlation; (ii) the vertical correlation; and (iii) the temporal-vertical correlation with predetermined setting values.

In contrast the present invention recites

a variable degree of presence of at least one of the spatial interpolation and the temporal interpolation in a composition of the output signal, with the composition having a range from one-hundred percent of the spatial interpolation to one-hundred percent of the temporal interpolation,

Stated differently, the passage between the spatial interpolation and the temporal interpolation is variable, giving progressiveness. This variability reduces the artifacts of discontinuity which appear with the implementation of the method described in Kim. Accordingly, independent claims 1 and 22 distinguish over Kim for at least this reason.

Furthermore, independent claims 1 and 22 have been amended to clarify

a function of a detection of motion in a portion of a video image being interpolated including a detection of a detail measurement in the portion of the video image for determining a degree of reliability the spatial interpolation.

1831; 2002 U.S. LEXIS 3818; 62 U.S.P.Q.2D (BNA) 1705)(Decided May 28, 2002).

The “a detection of a detail measurement in the portion of the video image for determining a degree of reliability the spatial interpolation” is not the same as the “space information” as described by Kim at col. 4, line 21. Kim describes that this space information is the vertical correlation DV. The measure DV disclosed in Kim is not a “detail measurement [...] for determining a degree of reliability the spatial interpolation “ Accordingly, independent claims 1 and 22 distinguish over Kim for at least this reason as well.

Continuing further, even arguing if the “space information” with the measure DV of Kim is analogized to the “measurement detail” of the present invention, Kim specifically restricts the measure DV only when the spatial interpolation is vertical. Kim is silent on using space information along any other direction. By contrast, according to the present invention, the detail measurement adapted to the spatial interpolation whatever the direction on which is based the spatial interpolation is based. Accordingly the present invention distinguishes over Kim for at least this reason as well. This feature of spatial interpretation made in all directions including non-vertical directions is further clarified in dependent claims 3-14 of the present invention by “a series of directions under consideration connecting pixels on different lines of a given pixel window”. Accordingly the claims 3-14 of the present invention distinguishes over Kim for at least this reason as well.

The Examiner cites 35 U.S.C. § 102(b) and a proper rejection requires that a single reference teach (i.e., identically describe) each and every element of the rejected claims as being anticipated by Kim.² Kim is completely silent on “a variable degree of presence of at least one of the spatial interpolation and the temporal interpolation in a

² See MPEP §2131 (Emphasis Added) “A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). “The identical invention must be shown in

composition of the output signal, with the composition having a range from one-hundred percent of the spatial interpolation to one-hundred percent of the temporal interpolation” and “a detection of a detail measurement in the portion of the video image for determining a degree of reliability the spatial interpolation. Accordingly the present invention distinguishes over Kim for at least these reasons.

In view of the foregoing, independent claims 1 and 22 distinguish over Kim. Dependent claims 2 and 23 depend from independent claims 1 and 22, respectively, and therefore include all of the limitations of those independent claims. The Applicants therefore further assert that dependent claims 2 and 23 also distinguish over the Kim. Therefore, the Applicants respectfully submit that the Examiner's rejection of claims 1, 2 and 22, 23 are in a condition for allowance, which allowance is respectfully requested.

(4) Rejection under 35 U.S.C. 102(b) by Ledinh

As noted above, the Examiner rejected claims 1-14, 16, 18, 22-25 under 35 U.S.C. 102(b) as being anticipated by Ledinh et al. (U.S. 5,936,676). Independent claims 1 and 22 have been amended to clarify over Ledinh. Amended independent claims 1 and 22 recites *inter alia*:

wherein the interpolating performed on the output signal is produced from a selection of a spatial interpolation and a temporal interpolation, whereby the selection is made based upon a determination of,

a variable degree of presence of at least one of the spatial interpolation and the temporal interpolation in a composition of the output signal, with the composition having a range from one-hundred percent of

as complete detail as is contained in the ... claim.”

the spatial interpolation to one-hundred percent of the temporal interpolation,

a function of a detection of motion in a portion of a video image being interpolated including a detection of a detail measurement in the portion of the video image for determining a degree of reliability the spatial interpolation.

Support for these amendments is found in the specification at, for example, page 4, par. [0015], page 7, par. [0054], page 10, par. [0075], page 21 through page 22 pars. [0206 - 0213] and page 26 through page 27 pars. [0259 - 0272]. No new matter has been added by these amendments.

Ledinh describes an interpolation method which combines three interpolation techniques, including: i) a steered spatio-temporal interpolation for moving edges; ii) a vertical interpolation for vertically moving horizontal lines; and iii) a temporal interpolation for local still picture parts.

In contrast the present invention recites

a variable degree of presence of at least one of the spatial interpolation and the temporal interpolation in a composition of the output signal, with the composition having a range from one-hundred percent of the spatial interpolation to one-hundred percent of the temporal interpolation,

Stated differently, the passage between the spatial interpolation and the temporal interpolation is variable, giving a progressiveness. Ledinh is silent on this progressiveness between the spatial interpolation and the temporal interpolation. This variability reduces the artifacts of discontinuity which appear with the implementation of the method described in Ledinh. Accordingly, independent claims 1 and 22 distinguish over Ledinh for at least this reason.

Furthermore, independent claims 1 and 22 have been amended to clarify

a function of a detection of motion in a portion of a video image being interpolated including a detection of a detail measurement in the portion of the video image for determining a degree of reliability the spatial interpolation.

Indeed, according to Ledinh, only the measure m that could be analogized to a measure of motion, is used to choose between a temporal interpolation (136) and a spatio-temporal interpolation (106). See Ledinh at col. 3, lines 38 – 67 and col. 5 lines 50-60. Further in Ledinh, the only element that could be analogized to a detail measurement is the data C (114), described in FIG. 3 (detail of the block 145 of Figure 1) and col. 7, lines 29 through col. 8 line 29. However, this is not the same as “a detection of a detail measurement in the portion of the video image for determining a degree of reliability the spatial interpolation used to take a decision about the relative degree of presence of spatial interpolation and temporal interpolation in the final interpolation. In contrast Ledinh the data C only affects the direction of interpolation of the spatio-temporal interpolation 106, as clearly shown by the connection 102 to the block 106 in the FIG. 1 of Ledinh. Accordingly, independent claims 1 and 22 distinguish over Ledinh for at least this reason as well.

Furthermore, in Ledinh the measure C at 114 at col. 7, lines 29-34, cannot be analogized to a measure of the reliability of the spatial interpolation, as it is the case for the detail measurement of the present invention.

Ledinh describes in fact two type of determination to define the relative degrees of contribution of the different types of interpolation in the final interpolation. At first, the adjustment of relative degrees between the spatio-temporal interpolation 106 and the vertical interpolation 128 and the adjustment of relative degrees between the temporal interpolation 136 and the spatio-temporal interpolation 133.

The relative degrees of presence of spatio-temporal interpolation 106 and vertical interpolation 128 are not function of the value C, but are only function of the presence of horizontal lines having a vertical motion See Ledinh item 132 of FIG.1.

Concerning the relative degrees of presence between the temporal interpolation 136 and spatio-temporal interpolation 133 to determine the final interpolation, they are only function of the measure of the motion m.

Consequently, by contrast with the essential feature of the invention, there is no measure in Ledinh comparable to a detail measurement or a spatial interpolation reliability measure to adjust the relative degrees of spatial and temporal contribution in the final interpolation. Accordingly, independent claims 1 and 22 distinguish over Ledinh for these reasons as well.

The Examiner cites 35 U.S.C. § 102(b) and a proper rejection requires that a single reference teach (i.e., identically describe) each and every element of the rejected claims as being anticipated by Ledinh.³ . Ledinh is completely silent on "a variable degree of presence of at least one of the spatial interpolation and the temporal interpolation in a composition of the output signal, with the composition having a range from one-hundred percent of the spatial interpolation to one-hundred percent of the temporal interpolation" and "a detection of a detail measurement in the portion of the video image for determining a degree of reliability the spatial interpolation". Accordingly the present invention distinguishes over Ledinh for at least this reason.

³ See MPEP §2131 (Emphasis Added) "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in

In view of the foregoing, independent claims 1 and 22 distinguish over Ledinh. Dependent claims 2-14, 16, 18, 22-25 depend from independent claims 1 and 22, respectively, and therefore include all of the limitations of those independent claims. The Applicants therefore further assert that dependent claims 2 and 23 also distinguish over the Kim. Therefore, the Applicants respectfully submit that the Examiner's rejection of claims 2-14, 16, 18, 22-25 are in a condition for allowance, which allowance is respectfully requested.

(5) Allowability of Claims 15, 18, 19-21 and 26

The Applicants also wish to thank Examiner Hsai for indicating the allowable subject matter of claims 15, 17, 19-21 and 26. As noted above the independent claims 1 and 22 have been amended to clarify over Kim and Ledinh. Accordingly, the Applicant respectfully submit that claims 1-26 are in a condition for allowance which allowance is respectfully requested.

CONCLUSION

In light of the Office Action, Applicant believes these amendments serve a useful clarification purpose, and are desirable for clarification purposes, independent of patentability. Accordingly, Applicant respectfully submits that the claim amendments do not limit the range of any permissible equivalents.

Applicant acknowledges the continuing duty of candor and good faith to the disclosure of information known to be material to the examination of this application. In accordance with 37 CFR §§ 1.56, all such information is dutifully made of record. The foreseeable equivalents of any territory surrendered by amendment is limited to the

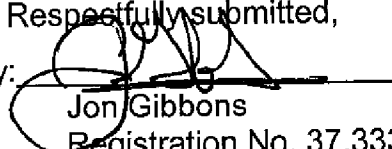
as complete detail as is contained in the ... claim."

territory taught by the information of record. No other territory afforded by the doctrine of equivalents is knowingly surrendered and everything else is unforeseeable at the time of this amendment by the Applicant and his attorneys.

Applicant respectfully submits that all of the grounds for rejection stated in the Examiner's Office Action have been overcome, and that all claims in the application are allowable. No new matter has been added. It is believed that the application is now in condition for allowance, which allowance is respectfully requested.

PLEASE, if for any reason the Examiner finds the application other than in condition for allowance, the Examiner is invited to call either of the undersigned attorneys at (561) 989-9811 should the Examiner believe a telephone interview would advance the prosecution of the application.

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